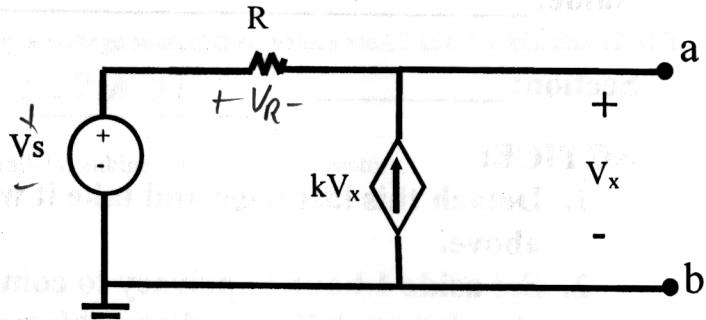


8. (12 pts) For the following circuit, find the Thevenin equivalent circuit looking into terminals a and b, using the procedure delineated below.

$$V_s = 5 \text{ V.}$$

$$R = 1 \Omega$$

$$k = 0.5 \frac{A}{V}$$



- Find V_{oc} across a to b.
- Find I_{sc} from a to b.
- Calculate R_{TH} and draw the Thevenin equivalent circuit.

$$V_x + V_R + V_s = 0$$

$$\begin{aligned} V_x &= V_s - V_R \\ &= V_s + kV_x R \end{aligned}$$

$$V_x (1 - kR) = V_s$$

$$\begin{aligned} V_R &= \frac{V_s}{1 - kR} \\ &\approx 10.0 \text{ V} \end{aligned}$$

$$\begin{aligned} I_{sc} &= kV_x + \frac{V_s}{R} \\ &\approx 5 \text{ A} \end{aligned}$$

$$R_{TH} = \frac{V_{oc}}{I_{sc}}$$

$$\begin{aligned} I_{sc} &= 2 \Omega \\ &= 2 \Omega \end{aligned}$$

